

# The Impact of Forensic Accounting on Fraud Detection

A. O. Enofe<sup>1</sup> P. O. Okpako<sup>1\*</sup> E.N. Atube<sup>1</sup>

Department of Accounting, Faculty of Management Sciences, University of Benin P.M.B. 1154, Benin City, Edo State, Nigeria.

\* E-mail of the corresponding author: [voweroh@gmail.com](mailto:voweroh@gmail.com)

## Abstract

The study examines the effect of forensic accounting on fraud detection in Nigerian firms. the aim of this study is to determine the relationship between fraud detection and forensic accounting. To achieve this objective, data was collected from primary sources. The primary data were collected with the help of a well-structured questionnaire of three sections administered to fifteen firms in Benin City Edo State. The collected data were analyzed with descriptive statistics using ordinary least square (OLS) regression and Chi-square. The study reveals that the application of forensic accounting services on firms affects the level of fraudulent activities.

**Key Words:** Forensic accountant, financial frauds, theft of cash/suppression of lodgment, Miscellaneous fraud, falsification of accounts, cashiering fraud, forged chequess with forged signature, computer operator fraud.

## 1. Introduction

The growing demand for forensic accounting is a known characteristic of most companies in the world. Forensic accounting arises from the effect and cause of fraud and technical error made by human. Forensic accounting is quite new in Nigeria as companies have realized that the service of a forensic accountant is needed as fraud cases have substantially increased in number. Forensic accounting is the application of financial skills and investigative mentality to unsettled issues, conducted within the context of the rules of evidence (Arokiasamy and Cristal, 2009).

Bologna and Lindquist (1987) assert that forensic accounting as a discipline encompasses fraud knowledge, financial expertise, and a sound knowledge and understanding of business reality and the working of the legal system. Forensic accounting may be one of the most effective and efficient way to decrease and check accounting fraud. Presently, forensic accounting is gaining popularity worldwide. It is been taught as a major course in many educational institutions in various countries.

### 1.1 Research Problem

Williams (2002) states that forensic accounting is recognized as having a particular form of professional expertise and endowed with identifiable attributes among which are rationality, neutrality, and independence. Forensic accountants possess a particular social recognition, observation that is critical to the translation of economic issues into symbolic displays of trust. The critical social value that forensic accountants possess is the symbolic capacity by which the translation is realized.

Forensic accounting provides cultural mediation for economic and political logics (Williams, 2002). It is the venue within which the cultural mediation of legal and economic claims is accomplished. The first decade of the twenty-first century experienced a tsunami or blizzard in the number of corporate scandals, frauds, and failures (Ball, 2009). These events precipitated and contributed to the Great Recession and significantly impacted the efficient functioning of free market capitalism. Some of which were actually facilitated by public accountants (cf. Enron and Arthur Andersen). The scandals, frauds, and failures have contributed to the loss of confidence by the financial statements users in the ability of public accounting to contribute viable solutions to the financial problems, and have fuelled the growth in demand for forensic accountants (Huber, 2012).

However, large company such as Cadbury Nig Plc, Oceanic Bank Plc and Afri Bank had been found involved in fraud. This is because it is always possible for high level management to access data and change the information, paper-based system or a computerized system alike. It all relates back to human nature and high level management. The possible way to solve this issue is that the public should be educated and be informed of the use and function of forensic accounting to prevent fraud occurrences. When the public is made known of the concept, then they could actually demand for the service in the company which they invest in.

Forensic accountants have played an increasingly important role in the litigation and other legal disputes fomented by these recent frauds and failures. The fact is that very little has been written in this area. Based on the problem stated above, this study focus on the impact of forensic accounting on fraud detection

### 1.2 Research Questions

The study is expected to answer the following questions:

- 1) To what extent does forensic accounting effect fraud detection?
- 2) To what extent does forensic accounting curb fraudulent activities in a firm?

### 1.3 Research Objectives

The main objective of the study is to examine the impact of forensic accounting on fraud detection. The specific objectives are to:

- 1) Find out the manner in which forensic accounting affect fraud detection.
- 2) Ascertain if forensic accounting will curb fraudulent activities.

### 1.4 Hypothesis

The following hypothesis will be tested:

H01: Forensic accounting does not affect fraud detection.

H02: Forensic accounting cannot curb fraudulent activities.

## 2. Literature Review

### 2.1 Forensic Accounting

Maurice E. Peloubet is credited with developing the term forensic accounting in his 1946 essay "Forensic Accounting: Its Place in Today's Economy." By the late 1940s, forensic accounting had proven its worth during World War II; however, formalized procedures were not put in place until the 1980s when major academic studies in the field were published (Rasey, 2009). Since the 1980s in some Western countries, particularly in the USA, a new profession in the field of accounting and auditing has emerged. This profession identifies a field composed of accounting, auditing, and investigative skills (Ozkul and Pamukc, 2012).

Forensic accounting is the specialty area of the accountancy profession which describes engagements that result from actual or anticipated disputes or litigation. "Forensic" means "suitable for use in a court of law," and it is to that standard and potential outcome that forensic accountants generally have to work (Crumbley, Heitger and Smith, 2005). Forensic accounting is recognized as a particular form of professional expertise and endowed with specific attributes; the recognition comes from possessing a formal certification in forensic accounting which provides symbolic value (Williams, 2002).

Forensic accounting is a science dealing with the application of accounting facts and concepts gathered through auditing methods, techniques and procedures to resolve legal problems which requires the integration of investigative, accounting, and auditing skills (Arokiasamy and Cristal, 2009; Dhar and Sarkar (2010). Stanbury and Paley-Menzies (2010) state that forensic accounting is the science of gathering and presenting information in a form that will be accepted by a court of jurisprudence against perpetrators of economic crime. Hopwood, Leiner, and Young (2008) argued that forensic accounting is the application of investigative and analytical skills for the purpose of resolving financial issues in a manner that meets standards required by courts of law. Degboro and Olofinola (2007) noted that forensic investigation is about the determination and establishment of fact in support of legal case. That is, to use forensic techniques to detect and investigate a crime is to expose all its attending features and identify the culprits.

In the view of Howard and Sheetz (2006), forensic accounting is the process of interpreting, summarizing and presenting complex financial issues clearly, succinctly and factually often in a court of law as an expert. It is concerned with the use of accounting discipline to help determine issues of facts in business litigation (Okunbor and Obaretin, 2010). Forensic accounting is a discipline that has its own models and methodologies of investigative procedures that search for assurance, attestation and advisory perspective to produce legal evidence. It is concerned with the evidentiary nature of accounting data, and as a practical field concerned with accounting fraud and forensic auditing; compliance, due diligence and risk assessment; detection of financial misrepresentation and financial statement fraud (Skousen and Wright, 2008); tax evasion; bankruptcy and valuation studies; violation of accounting regulation (Dhar and Sarkar, 2010).

The America Institute of Certified Public Accountants (AICPA) defines forensic accounting as services that involve the application of specialized knowledge and investigative skills possessed by Certified Public Accountants...Forensic accounting services utilize the practitioner's specialized accounting, auditing, economic, tax, and other skills (AICPA 2010). Singleton and Singleton (2010), said forensic accounting is the comprehensive view of fraud investigation. It includes preventing frauds and analyzing antifraud control which includes the gathering of nonfinancial information.

Bhasin (2007) noted that the objectives of forensic accounting include: assessment of damages caused by an auditors' negligence, fact finding to see whether an embezzlement has taken place, in what amount, and whether criminal proceedings are to be initiated; collection of evidence in a criminal proceedings; and computation of asset values in a divorce proceedings. He argues that the primary orientation of forensic accounting is explanatory analysis (cause and effect) of phenomenon including discovery of deception (if any), and its effects introduced into the accounting domain.

According to Bhasin (2007), forensic accountants are trained to look beyond the numbers and deal with the business realities of situations. Analysis, interpretation, summarization and the presentation of complex financial business related issues are prominent features of the profession. He further reported that the activities of forensic accountants involve: investigating and analyzing financial evidence; developing computerized applications to assists in the analysis and presentation of financial evidence; communicating their findings in the form of reports, exhibits and collections of documents; and assisting in legal proceedings, including testifying in courts, as an expert witness and preparing visual aids to support trial evidence. In the same vein Degboro and Olofinola (2007) stated that forensic accountants provide assistance of accounting nature in a financial criminal and related economic matters involving existing or pending cases as

specified by the Alliance for Excellence in Investigation and Forensic Accounting (Alliance) of Canada: assisting in obtaining documentation necessary to support or refute a claim; review of the relevant documentation to form an initial assessment of the cases and identify areas of loss; assistance with the examination for discovery and the formulation of questions to be asked regarding the financial evidence; attendance at the examination for discovery to review the testimony; assist with understanding the financial issues and to formulate additional questions; reviewing of the opposing expert's damaging report, and reporting on both the strengths and weaknesses of the position taken; and attendance at trial, to hear the testimony of the opposing expert and provide assistance with cross-examination.

Gray (2008) reported that the forensic accountants investigation include identification fraud. Gottschalk (2010) stated that the focus of forensic accounting is on evidence revealed by the examination of financial documents. The evidence collected or prepared by a forensic accountant may be applied in different contexts. According to Curtis (2008), forensic accountants are essential to the legal system, providing expert services such as fake invoicing valuations, suspicious bankruptcy valuations, and analysis of financial documents in fraud schemes.

These forensic accountants calculate values, draw conclusions and identify irregular patterns or suspicious transactions by critically analyzing the financial data (Arokiasamy and Cristal, 2009). It provides an accounting analysis to the court for dispute resolution in certain cases and it also provides the court with explanation to the fraud that has been committed. That is why forensic accounting may play a vital role in detecting and reducing accounting frauds in the business sector.

In this concept, forensic accountants provide an account analysis to determine the facts necessary to resolve a dispute before it is brought before the court or the lawsuit process takes its course (Ozkul and Pamukc, 2012).

The job of forensic accountants is to catch the perpetrator and fraud occurring in the companies per year. This includes tracing money laundering and identity theft activities as well as tax evasion. Insurance companies hire forensic accountants to detect insurance frauds such as arson, and law offices employ forensic accountants to identify marital assets in divorce cases (Weygandt, Kieso, and Kimmel, 2008).

Forensic accounting has been pivotal in the corporate agenda after the financial reporting problems which took place in some companies around the world. For instance, Enron, Tyco, and WorldCom. These scandals resulted in the loss of public trust and huge amounts of money. In order to avoid fraud and theft, and to restore the badly needed public confidence, several companies took the step to improve the infrastructure of their internal control and accounting systems drastically. It was this development which increased the importance of accountants who have chosen to specialize in forensic accounting and who are consequently referred as forensic accountants. Baird and Zelin (2009) say that forensic accounting is important investigative tool for detection of fraud.

## 2.2 Fraud Detection

Defining fraud is as difficult as identifying it. No definite and invariable rule can be laid down as a general proposition in defining fraud as it includes surprise, trick, cunning and unfair ways by which another is cheated. Fraud is a legal term that refers to the intentional misrepresentation of the truth in order to manipulate or deceive a company or individual. Fraud is to create a misjudgement or maintain an existing misjudgement to induce somebody to make a contract". It involves enriching oneself intentionally by reducing the value/worth of an asset in secret."When companies undergo severe financial problems and end up in bankruptcy, fraud by senior management may be involved.

David (2005), states that fraud is not a possibility but a probability. He also explains that fraud can be better prevented if decisions are made by a group and not an individual. However, this is not the case if the group has the same interest in mind. Then fraud may not be prevented. Conversely, the group is influenced by the dominant decision maker who ends up deciding everything. Russel (1978 cited in Bello, 2001) remarks that the term fraud is generic and is used in various ways. Fraud assumes so many different degrees and forms that courts are compelled to context themselves with only few general rules for its discovery and defeat. It is better not to define the term lest men should find ways of committing frauds which might evade such definitions.

Okafor (2004) also reported that fraud is a generic term and embraces all the multifarious means which human ingenuity can devise, which are resorted to by one individual to get advantage over another in false representation. According to Anyanwu (1993), fraud is an act or course of deception, deliberately practiced to gain unlawful or unfair advantage; such deception directed to the detriment of another.

Accounting fraud is an act of knowingly falsifying accounting records, such as sales or cost records, in order to boost the net income or sales figures; accounting fraud is illegal and subjects the company and the executives involved to civil lawsuits (Arokiasamy and Cristal, 2009). Company officials may resort to accounting fraud to reverse loss or to ensure that they meet earning expectations from shareholders or the public.

According to Karwai, (2002); Ajie and Ezi, (2000); Anyanwu, (1993); Okafor, (2004) and Adeniji, (2004) summarize the types of fraud on the basis of methods of perpetration include the following but not exhaustive as the methods are devised day in-day out to include: defalcation, suppression, outright theft and embezzlement, tampering with reserves, insider abuses and forgeries, fraudulent substitutions, unauthorized, unauthorized lending, lending to ghost borrowers, kite flying and cross firing, unofficial borrowing, impersonation, teeming and lading, fake payment, fraudulent use of the firms documents, fictitious accounts, false proceeds of collection, manipulation of vouchers, dry posting, over invoicing, inflation of statistical data, ledger accounts manipulation, fictitious contracts, duplication cheque books, computer fraud,

misuse of suspense accounts, false declaration of cash shortages etc

Bozkurt (2003) opined that there are two types of fraud committed in business: Personal use of business resources and Drawing up financial statements of the business falsely. Examples are: Embezzlement of the money during its collection but before it is recorded in accounts, tampering the bank records and taking monetary advantage, gaining advantage through forgery of documents, making payments which should not be made or previously made, creating fictitious debts and having payments done in favor of oneself, inventory and scrap theft, office supplies and fixed asset theft, creating fictitious expenses and obtaining disbursements, creating ghost employees and embezzling their wages/salaries, benefiting from overstated personal expenditures and selling business assets under the market value.

According to (Ozkul and Pamukc, 2012), the following are the objective of financial statement fraud: Increasing the market value of the business, making financial statements consistent with budgets and obtaining unfair earnings by presenting falsely the value of the business.

When business frauds are analyzed, it is ascertained that three components come together when committing the crime. These are pressure, opportunity, and justification that constitute the fraud triangle. Components of the fraud triangle are similar to the fuel, spark, and oxygen which together cause fire. When the three come together, inevitably fire breaks out. Pressure factors could be gathered into three groups: pressures with financial content, pressures stemming from bad habits and pressures related with job. Opportunity factors are the second component of the fraud triangle. They directly involve top management and owners of the business in particular. Providing the opportunity to commit fraud is one of the most important factors arising from frauds. Since the business could greatly influence opportunity factor, this point should receive particular attention for fraud prevention. The third component of the fraud triangle is fraudster's developing defence mechanisms in order to justify his/her action. Some efforts of the fraudsters to justify themselves and the excuse they made up are: (a) I had borrowed the money, I would pay back, (b) This is in return for my efforts for the business (c) Nobody has suffered as a result of this and (d) I have taken the money for a good purpose. In order to overcome these justifying excuses, business should explain ethic rules to employees, inform them that fraudsters would definitely be penalized, establish moral code in the organization, and provide training on them.

Over time, the importance of initial detection of fraud has increased because the number of fraudulent events has increased. Detection of fraud begins with the notification of red flags which indicates that something is wrong (Ozkul and Pamukc, 2012). This might come to light as a result of trends in the number of employees, managers, and victims concerned about the loss in business assets. There are two main ways to detect frauds: (a) Detection by chance and (b) Conducting a proactive research and encouraging initial identification of symptoms

Many fraudulent acts have been detected in the past by chance. Unfortunately, the incidence of fraud proceeds during detection and losses consequently increase. In many cases, people who are exposed to fraud in the organization do know that fraud was being committed, but could not bring it to light either because they are not sure and unwilling to blame someone directly or are unsure of how to go about reporting it and might also be afraid of being labelled as whistleblower (Ozkul and Pamukc, 2012).

Fraud is costly. According to the Association of Certified Fraud Examinations (ACFE), an estimated \$3.5 trillion worldwide were lost due to fraudulent financial statements, asset misappropriation, and corruption in 2011 (ACFE, 2012). In an effort to restore public trust in the audit profession, accounting standard setters have increased the steps auditors are expected to take in order to detect fraud. As a result of the Enron and WorldCom debacles, auditors are currently required to adhere to the requirements of Statement on Auditing Standards (SAS) No. 99. (cited in Chui and Pike, 2013). Rezaee (2004) revealed that financial statement fraud has cost market participation more than USD\$500 billion during recent years, with serious litigation consequences. It will also give a view towards companies who wish to educate and increase awareness among of the public regarding the seriousness of the fraud in Nigeria. This research will lead to the awareness and acceptance level of forensic accounting.

Karwai (2002) reported that the identification of the causes of fraud is very difficult. He stated that modern day organizations frauds usually involve a complex web of conspiracy and deception that often mask the actual cause. Ajie and Ezi (2000) are of the view that studies have shown that on the average out of every ten (10) staff would look for ways to steal if given the opportunity and thus only could four (4) be normally honest. The widespread frauds in modern organizations have made traditional auditing and investigation inefficient and ineffective in the detection and prevention of the various types of frauds confronting businesses world-wide.

Oyejide (2008) opine that fraud is a subject that has received a lot of attention both globally and in Nigeria. This interest has been heightened by several high profile cases involving several organizations. Issues relating to fraud have also been the subject of rigorous theoretical and empirical analysis in the academic literature (Appah and Appiah, 2010). In the words of Adesola (2008), the threat of fraud to the global economy is better illustrated by the statistics released by Criminologists at a consultancy: over two hundred thousand cases of online frauds were committed in the United Kingdom in 2006, doubled the amount of real world robberies. The study revealed that 75% of card not present fraud was committed on-line in 2006. The global market is concerned about fraud in high and low places. We are very familiar with Enron, WorldCom etc. We are also experiencing more and more frauds committed in the society.

The primary responsibility of an auditor is to verify whether the financial statements exhibit a true and fair view of state of



affair of the business and their secondary responsibility is the prevention and detection of errors and frauds. The primary responsibility for the prevention and detection of fraud and error rests with both those charged with governance and the management of an entity in spite of the fact that financial statements are the representations of the management. Some authors have acknowledged that there are limitations in the way individual auditors make fraud judgments (Wilks and Zimbelman, 2004).

Furthermore, fraud, in whatever nature and guise, has to be detected first, since detected is an important prerequisite of rooting out any sort of. On their own, auditors are not necessarily the most suitable group to perform the task of fraud detection. The company, by instituting appropriate fraud prevention measures within its organisation, can detect and prevent non-management fraud (Hemraj, 2004). It is the duty of the forensic accountant to detect fraud. An increasing number of studies examine the factors that tempt firms to commit fraud, such as high-powered executive incentives (Johnson, Ryan, and Tian, 2005; Bergstresser and Philippon, 2006; Efendi, Srivastava, and Swanson, 2006; Peng and Röell, 2006), and weak board structure (Beasley, 1996; Agrawal and Chadha, 2005). However, firms with the largest defence contracts have less negative abnormal returns than those with smaller contracts. Dyck, Morse, and Zingales (2006a, 2006b) examine the role of different monitoring devices in fraud detection and find that market-based institutions play a more significant role than regulatory-based institutions.

### **2.3 Forensic Accounting and Fraud Detection**

Albrecht, (2005) argued that fraud is rarely seen. He said that the symptoms of fraud are usually observed. The symptoms do not necessarily mean fraud is being undergone as it may be caused by mistakes. The writer advises are mainly to be cautious when fraud is reported as it may be false allegations. Fraud is not easily proven since frauds have themselves at a safe line where authority could not convict them. This shows that the author is explaining that the fraud defaulters are getting smarter due to the possible mistakes human can cause. This has made detecting and proving fraud a hard work for a forensic accountant. There is a need for deeper understanding on how these defaulters work their fraudulent act. Without constant involvement of the public and improvement in forensic accounting, fraud cases will be hard to detect and thus lead to greater success in financial fraud, which also translates into the failure to meet the expectations of the public, shareholders or even other stakeholders.

Ramaswamy (2005) states that poor corporate governance and accounting failure is one of the reasons why fraud cases emerge. This is because poor corporate governance will lead to the ability of certain individual or a group of people with the same interest to act upon it to commit fraudulent activities in the company. He also states that the problems within the corporate reporting system as a reason because of lack of well implemented policy of corporate governance. This can be reinforced by the fact that top level management should follow the policies of the firm which will help the company to perform better. The problem comes from the fact that certain corporate leaders do not have positive attitude regarding the policies.

Therefore, lack of honesty and transparency in reporting financial statement is another problem. It is agreeable that an auditor does not have the absolute duty to uncover fraud, but they should practice fair and true reporting to ensure that the interests of the public as well as the employees are protected. With the use of forensic accounting guidelines, auditors can act as forensic accountants in cases of suspicious fraud or criminal activities in a company. Ineffective and inefficient system of internal control which is stated by the author points out that a weak management cannot be changed with internal control system. Even if a company applies good internal control systems, the management will still be the major factor influencing the implementation. Companies should look towards new approaches rather than follow the traditional approach as forensic accounting may be the next best alternative in resolving problems.

Ramazani and Refiie (2010) studied the accountants' perception of prevention methods of fraud. In this research they examined accountants' perception of forensic accounting which demonstrates the low extent of accountant's perception of forensic accounting. Forensic accounting is considered as one of the factors in fraud prevention. (Bierstaker, Brody and Pacini, 2006).

Okoye and Gbegi (2013) carried out a study on the evaluation of forensic accountants to planning management fraud risk detection procedures. The study reveals that forensic accountants effectively modify the extent and nature of audit test when the risk of management fraud is high, forensic accountants propose unique procedures that are not proposed by auditors when the risk of management fraud is high, forensic accountants can make to the effectiveness of an audit plan when the risk of management fraud is high, involving forensic accountants in the risk of management fraud assessment process leads to better results than simply consulting them.

KPMG's Fraud Survey (2003) reveals that more companies are: recently experiencing incidents of fraud than in prior years; taking measures to combat fraud; and launching new antifraud initiatives and programs in response to the Sarbanes-Oxley Act of 2002 (KPMG 2003). PricewaterhouseCoopers' (PWC) 2003 Global Crime Survey indicates that 37 percent of respondents in 50 countries reported significant economic crimes with the average loss per company of \$2,199, 930 (PWC 2003). These survey results underscore the importance of forensic accounting practice and education.

Prior research (Rezaee 2002; Crumbley 2003 and 2009; Peterson and Reider 1999, 2001; Rezaee, Reinstein, and Landar 1996; Rezaee and Burton 1997) reviews the literature on forensic accounting practices, certifications, and education. These studies also provide evidence indicating that forensic accounting education has evolved from being limited, to

continuing professional education sessions for practicing accountants, to a current state of being offered as a credit course by several universities. Buckhoff and Schrader's study (2000) finds, "adding a forensic accounting course to the accounting curriculum can greatly benefit the three major stakeholders in accounting education—academic institutions, students, and employers of accounting graduates."

Empirical evidence from a study by Boritz, Kotchetova and Robinson (2008) confirms that forensic accountants could detect significantly higher number of fraud than auditors. Srivastava, Mock and Turner (2003) in their study found that forensic audit procedures significantly lowered fraud risks. Furthermore, research has also proven that proactive forensic data analysis using computer based sophisticated analytical tests can detect fraud that may remain unnoticed for years (Brown, Aiken, and Visser 2007). A study by Bierstaker, Brody and Pacini (2006) researched accountants' perception regarding fraud detection and prevention methods. The findings revealed that organizational use of forensic accountants was the least often used of any anti-fraud method but had the highest effectiveness rating. This is similar to the findings of Ernst and Young's (2003) worldwide fraud survey, which states that only 20% of organizations employed forensic accountants although the satisfaction level for the service 88% was the highest.

According to the US General Accounting Office (GAO) (1996), there is now a strong emphasis on fraud prevention and detection during statutory audits. In fact the United States and international standards setters have increased the responsibility of auditors to consider the risks of fraud while conducting audits of financial statements. There is even a call for stronger forensic skills in those who perform these audits. This has been collaborated by Enyi (2009) who submits that all normal statutory audits should contain some elements of forensic enquiry as the evidence of fraudulent activities can be easily discovered if a thorough evaluation of the adequacy and compliance of the internal control mechanism is made. All these are aimed at fraud prevention and detection. But, this may not be achieved by an auditor without some understanding of forensic accounting methods (Efiong, 2012).

### 3. Methodology

The objective of the present research is to answer the research question and identify whether there is a relationship between forensic accounting and fraud detection. The survey method is selected for the purpose of this study in order to collect a sufficient amount of primary data. The use of questionnaires is the most widely used data collection technique in a survey and, in this study. The data collected are analysed using Chi-square statistical software and OLS regression analysis these are employed and the results will be used to validate or invalidate the hypothesis. The findings will be discussed and conclusions will be drawn.

### 4. Data Analysis and Interpretation

This section of the study has been mapped out to aid the presentation and discussion of empirical results. As it were, the study attempts to examine empirically the impact of forensic accounting on fraud detection such variables as: Theft of cash/suppression of lodgement, miscellaneous fraud, falsification of accounts, cashiering fraud, forged cheques with forged signature computer operator's fraud. A proxy for variable fraud detection as independent variables.

The method of Ordinary Least Squares (OLS) estimating regression equations and was employed. The choice of this technique arises as a result of the fact that, it is subject to some crucial assumption of the error-term and this provides the "best" (minimum variance), unbiased linear estimator (BLUE PRINT) of the parameter estimates of a single equation model. This again arises from the fact that the best linear unbiased estimator of the unknown parameters is obtained by minimizing the residual (error) sum of squares.

**Table 1: Coefficients**

| Model      | Unstandardized Coefficients |            | Standardized Coefficients | t       | Sig. |
|------------|-----------------------------|------------|---------------------------|---------|------|
|            | B                           | Std. Error | Beta                      |         |      |
| (Constant) | -2161.741                   | 901.781    |                           | -2.397  | .139 |
| TCSL       | -.001                       | .003       | -.005                     | -.172   | .879 |
| FOA        | -200.037                    | 16.850     | -.018                     | 11.872  | .007 |
| CF         | 229.711                     | .347       | .994                      | 662.764 | .000 |
| FCFS       | .000                        | .000       | .005                      | 1.457   | .282 |
| COF        | .000                        | .001       | -.023                     | -.754   | .530 |

a. Dependent Variable: FD

$$FD_{Prox} = -2161.741 - .001TCSL - 200.037FOA + 229.711CF + .000FCFS + .0000COF$$

$$t_{val} = \frac{-2161.741}{901.781} \quad \frac{-.001}{.003} \quad \frac{-200.037}{16.850} \quad \frac{229.711}{.347} \quad \frac{.000}{.000} \quad \frac{.000}{.001}$$

A close examination of the Cochrane Occult results in equation above shows that the results in general are

satisfactory. The diagnostic statistics obtained from the estimation exercise are very much impressive. For example, after adjusting for degrees of freedom, the R bar squared stood at 1.000, accounting which is about 100% of the total variations in the fraud detection carried out satisfies the sample period 2007-2012, justifying apparently that the fit to the data to the model was very good. The f-statistic again reinforced this.

**Table 2: ANOVA**

| Model      | Sum of Squares   | Df | Mean Square      | F          | Sig.              |
|------------|------------------|----|------------------|------------|-------------------|
| Regression | 765557077258.792 | 5  | 153111415451.758 | 121182.966 | .000 <sup>b</sup> |
| Residual   | 2526946.162      | 2  | 1263473.081      |            |                   |
| Total      | 765559604204.954 | 7  |                  |            |                   |

a. Dependent Variable: FD

a. Predictors: (Constant),

**Table 3: Model Summary**

| Model | R                  | R Square | Adjusted R Square | Std. Error of the Estimate |
|-------|--------------------|----------|-------------------|----------------------------|
| 1     | 1.000 <sup>a</sup> | 1.000    | 1.000             | 1124.043185                |

b. Predictors: (Constant), TCSL,FOA,CF,FCFS,COF<sup>b</sup>.

**Table 4: Excluded variables**

| Model | Beta In           | T      | Sig. | Partial Correlation | Collinearity Statistics |
|-------|-------------------|--------|------|---------------------|-------------------------|
|       |                   |        |      |                     | Tolerance               |
| 1 MF  | .963 <sup>b</sup> | 36.035 | .018 | 1.000               | 3.553E-006              |

a. Dependent Variable: FD

c. Predictors in the Model: (Constant), TCSL,FOA,CF,FCFS,COF<sup>b</sup>.

Thus, with an f-value of 121182.966, the overall model is found to be significant, hence the hypothesis of a significant linear relationship between fraud detection and forensic accounting explanatory variables namely, theft of cash/suppression of lodgement, miscellaneous fraud, falsification of accounts, cashiering fraud, forged cheques with forged signature, computer operators fraud, all taken together is as a matter validated. The implication of this is that the estimated fraud detection equation has an overall goodness-of-fit especially when the computed F-statistic (121182.966) exceeds the critical value, easily passing the significance test. The standard-error of estimation is also high at 1124.043, hence taking the ratio of (see), the standard error of estimation, to the mean of the dependent variable, we have the error estimation is 901.781. This again implies that a very high forecasting performance is associated with the estimated equation.

Hence, both the residual variance and the error of prediction are very high. The serial correlation associated with the preliminary Ordinary Least Square (OLS) regression results have been eliminated as evidenced by a DW-statistic of 1.97. Also, the estimated parameters of the autoregressive error specification reveals that all the autoregressive schemes i.e. first, second and third autoregressive parameters are statistically different from zero even at the conservative 1% level of significance. Considering the individual significance of the variables, all the variable of the firm appears to have passed the significance test even at the conservative 1% level. Thus, with a t-value of 36.035 greater than the table t-value of 0.18 it is obvious that the coefficient of the fraud detection variable is significantly different from zero.

The sign and statistical significance of the variable makes it a policy relevant variable especially when the results are devoid of the problem of autocorrelation. The empirically evidence obtained with respect to this variable shows that a rising effect of forensic accounting of a firm does indeed affect the overhaul of the financial report. It does so in a significantly positive way looking at the anova table.

### 5. Summary of Findings

The application of forensic accounting services by quoted companies in Nigeria is not effective in curbing fraudulent activities. The ineffectiveness of the employment of forensic accounting services by corporate organization in Nigeria has strong implications for sound corporate governance. The emergence of e-business and its growing sophistications have not done much in the reduction of unwholesome practices in Nigeria as envisaged in the dawn of the millennium by most corruption fighters. Policy makers in the world have instituted policies of which some in the form of legislations just in an effort to stampede the monster but everything seems to be ineffective.

Test Statistics. Chi-Square= 180.611 Degree of freedom= 36 Asymp.Sig=.000 (see appendices)

Level of Significance=0.05 With the level of significance 0.05, degree of freedom 36, the computed value using Statistical Package for Social Sciences (SPSS) is 180.611, while the tabulated figure is 9.49 meaning that the computed figure is higher than the tabulated. Hence we reject the null hypothesis and accept the alternate which says that Forensic accounting has strong relationship with fraud detection for public confidence and eradication of crime and corruption in Nigerian economy Hypothesis 2 H<sub>1</sub> Forensic accounting does not curb fraudulent activities created by traditional auditing style.

### 6. Conclusion and Recommendation

On the basis of this finding, the paper concludes that forensic accounting services provide firms with the necessary tools to deter fraudulent activities but does not curb fraudulent activities.

The gap can be filled by introducing and adapt forensic accounting as financial strategy to curb economic and financial crime:

- Forensic Accounting will provide litigation support service with appropriate provision of professional services in the law courts
- Forensic Accounting will institute good corporate governance in the public sector which will install public confidence in the government and the entire system.
- The traditional auditing has limitation in detecting fraudulent practices which the forensic accountants will effectively fill. They have the professional ability back up by law to break into the organization system and examine the books, make discoveries and present the documentary evidences in the law courts.
- The image of Nigeria in the international community has discouraged foreign direct investment because of economic and financial crime. This has effect on development, employment and the standard of living of the people. Eradication of economic and financial crime through the adoption of forensic accounting in the system will improve the image of firms under review.
- Detection and prevention of corruption have given rise to the profession of forensic accounting. Due to this fact, the most important thing companies have to do with regard to fraud is to prevent the crime from being committed.
- Government and regulatory authorities should ensure the provision of standards and guidelines to regulate forensic activities and above all Nigerians should embrace integrity, objectivity, fairness and accountability in their day-to-day activities.

### References

- Adeniji, A. A. (2004). *Auditing and investigation*, Lagos: Value analysis consult.
- Adesola, A. (2008). Government's anti-corruption initiative: The role of computer assisted audit techniques in fraud detection and prevention. *Nigeria Accountant*, 41(1).
- Agrawal, A., & Chadha, S. (2005). Corporate governance and accounting scandals. *Journal of Law and Economics*, 48: 371-406.
- Ajie, H.A., & Ezi, C. T. (2000). *Financial institutions and markets*. Owerri: Corporate impression.
- Albrecht, W.S. (2005). *Identifying fraudulent financial transactions: A framework for detecting financial statement fraud*, Brigham: Brigham Young University.
- American Institute of Certified Public Accountants. (2010). FVS Practice Aid 10-1: Serving as an Expert Witness or Consultant. New York: Author
- Anyanwu, J. C. (1993). *Monetary economics: Theory, policy and institution*, Onitsha: Hybrid.
- Appah, E., & Appiah, Z. K. A. (2010). Fraud and the development of sound financial institutions in Nigeria. *Nigerian Journal of Development and Resources*, 1(1).
- Arokiasamy, L., & Cristal-Lee, S. (2009). Forensic accounting: Public acceptance towards occurrence of fraud detection. *International Journal of Business and Management*. 145-160
- Association of Certified Fraud Examiner (ACFE) (2012). Report to the Nations on Occupational Fraud and Abuse. Austin, TX: Association of Certified Fraud Examiners.



- Baird, J.E., & Zelin, R. C. (2009). An examination of the impact of obedience pressure on perceptions of fraudulent acts and the likelihood of committing occupational fraud. *Journal of Forensic Studies, Accounting Business*.
- Ball, R. (2009). Market and political/regulatory perspectives on the recent accounting scandals. *Journal of Accounting Research* 47(2), 277-323.
- Beasley, M. (1996). An empirical analysis of the relation between the board of director composition and financial statement fraud, *The Accounting Review*, 71: 443-465.
- Bello (2001). Fraud prevention and control in Nigerian public service: The need for a dimensional approach. *Journal of Business Administration*, 1(2), 118-133.
- Bergstresser, D. B., & Philippon, T. (2006). CEO incentives and earnings management, *Journal of Financial Economics*.
- Bhasin, M. (2007). Forensic accounting: A new paradigm for niche consulting. *The Chartered Accountant, Country*, 1000-1010.
- Bierstaker, J. L., Brody, R. G., & Pacini, C. (2006). Accountants' perceptions regarding fraud detection and prevention methods. *Managerial Auditing Journal*, 21(5), 520-535.
- Bologna, G.J., & Lindquist, R.J. (1987). *Fraud auditing and forensic accounting: New tools and techniques*, Hoboken, New Jersey: Wiley.
- Boritz, J. E., Kotchetova, N., & Robinson, L. A. (2008). *Planning fraud detection procedures: Forensic accountants vs auditors*. IFA conference. [available at <http://aaahq.org/meetings/AUD2009/PlanningFraudDetectionProcedures.pdf>]
- Bozkurt, E. (2003). Fraud detection and forensic accounting. Retrieved from <http://www.springer.com/cda/content/document/9783642c1.pdf%3FSGWID%3D0-0-45-1326442-p174119761&sa=U&ei=oBCGML6PMGkgagK&ved=0CBcLmQ>.
- Brown, A., Aiken, P., & Visser, L. (2007). Reducing fraud: A programme that will deliver benefits on the bottom line. *Accountancy Ireland*, 39(6), 28-30.
- Buckhoff, T. A. & Schrader, R. W. (2000). The teaching of forensic accounting. *Journal of Forensic Accounting*, 1 (1), 135-146.
- Canadian Institute of Chartered Accountants.
- Chui, L., & Pike, B. (2013). Auditors' responsibility for fraud detection. *Journal of Forensic and Investigative Accounting*, 5(1), 204-233.
- Crumbley, D. L. (2003). What is forensic accounting? Forensic accounting: Older than you think. *Journal of Forensic Accounting*, 11(2), 181-202. Retrieved from: [www.edwardpub.com](http://www.edwardpub.com)
- Crumbley, D. L. (2009). So what is forensic accounting? *The ABO Reporter* Fall (9)
- Crumbley, D.L., Heitger, L.E., & Smith, G.S. (2005). *Forensic and Investigative Accounting*. CCH Group, Chicago, IL
- Curtis, G. E. (2008). Legal and regulatory environments and ethics: Essential components of fraud and forensic accounting curriculum. *Issues in Accounting Education*, 23(4), 535-543
- David, A. (2005). Low level fraud is a high level issue, supply management. Retrieved from: <http://www.highbeam.com/doc/1P3-821992191.html>.
- Degboro, D., & Olofinola, J. (2007). Forensic accountants and the litigation support engagement. *Nigerian Accountant*, 40(2), 49-52.
- Dhar, P., & Sarkar, A. (2010). Forensic accounting: An accountant's vision. *Vidyasagar University Journal of Commerce*, 15(3), 93-104.
- Dyck, A., Morse, A., & Luigi Zingales, L. (2006a). Who blows the whistle on corporate fraud? Working Paper, University of Chicago.
- Dyck, A., Morse, A., & Luigi Zingales, L. (2006b). The nature of corporate fraud, Working Paper, University of Chicago.
- Efendi, J., Srivastava, A., & Swanson, E.P. (2006). Why do corporate managers misstate financial statements? The role of in-the-money options and other incentives, Working Paper, Texas A&M University.
- Efiong, E. J. (2012). Forensic accounting education: An exploration of level of awareness in developing economies - Nigeria as a case study. *International Journal of Business and Management*, 7 (4).
- Enyi, E. P. (2009). Detecting causes of variances in operational outputs of manufacturing organization: A forensic accounting investigation approach. Retrieved from <http://ssrn.com/abstract=1144783>.
- Ernst & Young. (2003). *Fraud: Unmanaged risk*. 8<sup>th</sup> global survey. Global investigations dispute advisory services, South Africa.
- General Accounting Office (1996). *The accounting profession major issues: progress and concerns*. New York: GAO.
- Gottschalk, P. (2010). Prevention of white collar crime: The role of accounting. *Journal of Forensic and Investigative Accounting*, 3(1), 23-48.
- Gray, D. (2008). Forensic accounting and auditing: compared and contrasted to traditional accounting and auditing. *American Journal of Business Education*, 1(2), 115-126.
- Hemraj, M. B. (2004). Prevention Corporate Scandals, *Journal of Financial Crime*, Vol.11, Iss. 3, pp. 268-276.
- Hopwood, W. S., Leiner, J.J., & Young G.R. (2008). *Forensic Accounting*. New York: McGraw-Hill/Irwin.

- Howard, S. and Sheetz, M. (2006). *Forensic accounting and fraud investigation for non-experts*. New Jersey: John Wiley and Sons Inc.
- Huber, D.W. (2012). Is Forensic Accounting in the United States Becoming a Profession? *Journal of Forensic and Investigative Accounting*, 4(1), 255-283
- Johnson, S.A., E. Ryan, H.E., & Tian, S.Y. (2005). Executive compensation and corporate fraud, Working Paper, Texas A&M University.
- Karwai, S. A. (2002). Bank Fraud: Can Shari'ah prevent it? *Journal of Business Administration*, 2(1), 62-78.
- KMPG. (2003). *Forensic and Fraud Survey*. Montvale, NJ.
- Okafor, B. (2004). Strategic approach to reduction of employee, theft fraud and embezzlement. *Nigerian Accountant*, 37(4), 3-5.
- Okoye, E.I., & Gbegi, D.O. (2013). An evaluation of forensic accountants to planning management fraud risk detection procedures. *Global Journal of Management and Business Research*, 13(1), 1-17
- Okunbor, J.A., & Obaretin, O. (2010). Effectiveness of the application of forensic accounting services in Nigerian organisations. *Journal of Management Sciences*, 1(1), 171-184.
- Oyejide, A. (2008). Corruption and development: A Nigerian perspective. *Nigerian Accountant*, 41(4), 28-42.
- Ozkul, F.U., & Pamukc, A. (2012). *Fraud detection and Forensic Accounting*, Istanbul, Turkey.
- Peng, L., & Röell, A. (2006). Executive pay and shareholder litigation, *Review of Finance*, forthcoming.
- Peterson, B. K., & Reider, B. P. (1999). Fraud education of accounting students: A survey of accounting educators. *The National Accounting Journal*, 23-30.
- Peterson, B. K., & Reider, B. P. (2001). An examination of forensic accounting courses: Content and learning activities. *Journal of Forensic Accounting*, 2 (1), 25-42.
- PricewaterhouseCoopers (2003). Global economic crime survey. Retrieved from <http://www.pwc.com/extweb/ncsurvers.nsf>.
- Ramaswamy, V. (2005). Corporate governance and the forensic accountant. Retrieved from :<http://www.nysscpa.org/cpajournal/2005/305/essentials/p68.htm>.
- Ramazani, M., & Rafiei, A. H. (2010). Iranian accountants conception of the prevention methods of fraud and offering some recommendations to reduce fraud in Iran. *Global Journal of Management and Business Research*, 10 (6), 31-45.
- Rasey, M. (2009). History of forensic accounting. Retrieved from [http://www.ehow.com/about\\_5005763\\_history-forensic-accounting.html](http://www.ehow.com/about_5005763_history-forensic-accounting.html)
- Rezaee, Z. (2002). Forensic accounting practices, education, and certifications. *Journal of Forensic Accounting*, 3 (2), 207-223.
- Rezaee, Z. (2004). *Causes, consequences and deterrence of financial statement fraud*. Critical Perspective on Accounting.
- Rezaee, Z., & Burton, E. J. (1997). Forensic accounting education: insights from academicians and certified fraud examiner practitioners. *Managerial Auditing Journal*, 12 (9), 479-489.
- Rezaee, Z., Reinstein, A., & Lander, G. H. (1996). Integrating forensic accounting into the accounting curriculum. *Accounting Education*, 1 (2), 147-162.
- Singleton, T. W., & Singleton, A.J. (2010). *Fraud Auditing and Forensic Accounting*, (3rd ed.). New York: John Wiley & Sons.
- Skousen, C. J., & Wright, C. J. (2008). Contemporaneous risk factors and the prediction of financial statement fraud. *Journal of Forensic Accounting*, 9: 37-62.
- Srivastava, R. P., Mock, T. J., & Turner, J. L. (2003). *The effects of Integrity, opportunity, incentives, mitigating factors and forensic audit procedures on fraud risk*. Business and information management auditing research workshop, Australian national university.
- Stanbury, J., & Paley-Menzies, C. (2010). Forensic Futurama: Why Forensic Accounting Is Evolving. Retrieved from <http://www.aicpa.org/Publications/Newsletters/AICPACPAInsider/2010/jun28/Pages/ForensicFuturamaWhyForensicAccountingIsEvolving.aspx>.
- Weygandt, J. J., Kieso, D.E., & Kimmel, P.D. (2008). *Accounting principles*, (8<sup>th</sup> ed.). Wiley. Retrieved from <http://www.kpmg.co.uk/news/detail.cfm?pr/43541>.
- Wilks, J. T., Zimbelman. (2004). New approaches to fraud deterrence, *Journal of Accountancy*, 197 (2), 72.
- Williams, J. W. (2002). *Playing the Corporate Shell Game: The Forensic Accounting and Investigation Industry, Law, and the Management of Organizational Appearances*. Doctoral Dissertation, Toronto: York University.

## Appendix Regression

**Variables Entered/Removed<sup>a</sup>**

| Model | Variables Entered                        | Variables Removed | Method |
|-------|--|-------------------|--------|
| 1     | TCSL,FOA, CF,s<br>FCFS, COF <sup>b</sup> | .                 | Enter  |

a. Dependent Variable: FD

b. Tolerance = .000 limits reached.

**Model Summary**

| Model | R                  | R Square | Adjusted R Square | Std. Error of the Estimate |
|-------|--------------------|----------|-------------------|----------------------------|
| 1     | 1.000 <sup>a</sup> | 1.000    | 1.000             | 1124.043185                |

d. Predictors: (Constant), TCSL,FOA,CF,FCFS,COF<sup>b</sup>.

**ANOVA<sup>a</sup>**

| Model      | Sum of Squares   | Df | Mean Square      | F          | Sig.              |
|------------|------------------|----|------------------|------------|-------------------|
| Regression | 765557077258.792 | 5  | 153111415451.758 | 121182.966 | .000 <sup>b</sup> |
| Residual   | 2526946.162      | 2  | 1263473.081      |            |                   |
| Total      | 765559604204.954 | 7  |                  |            |                   |

a. Dependent Variable: FD

b. Predictors: (Constant),

**Coefficients<sup>a</sup>**

| Model      | Unstandardized Coefficients |            | Standardized Coefficients | t       | Sig. |
|------------|-----------------------------|------------|---------------------------|---------|------|
|            | B                           | Std. Error | Beta                      |         |      |
| (Constant) | -2161.741                   | 901.781    |                           | -2.397  | .139 |
| TCSL       | -.001                       | .003       | -.005                     | -.172   | .879 |
| FOA        | -200.037                    | 16.850     | -.018                     | 11.872  | .007 |
| CF         | 229.711                     | .347       | .994                      | 662.764 | .000 |
| FCFS       | .000                        | .000       | .005                      | 1.457   | .282 |
| COF        | .000                        | .001       | -.023                     | -.754   | .530 |

a. Dependent Variable: FD

s

**Excluded Variables<sup>a</sup>**

| Model | Beta In           | T      | Sig. | Partial Correlation | Collinearity Statistics |
|-------|-------------------|--------|------|---------------------|-------------------------|
|       |                   |        |      |                     | Tolerance               |
| 1 MF  | .963 <sup>b</sup> | 36.035 | .018 | 1.000               | 3.553E-006              |

a. Dependent Variable: FD

e. Predictors in the Model: (Constant), TCSL,FOA,CF,FCFS,COF<sup>b</sup>.

## Results for: Worksheet

### Chi-Square Test: SA, A, UD, D, SD

Expected counts are printed below observed counts

Chi-Square contributions are printed below expected counts

|       | SA     | A     | UD    | D      | SD     | Total |
|-------|--------|-------|-------|--------|--------|-------|
| 1     | 17     | 8     | 5     | 0      | 0      | 30    |
|       | 11.90  | 9.20  | 4.90  | 2.20   | 1.80   |       |
|       | 2.186  | 0.157 | 0.002 | 2.200  | 1.800  |       |
| 2     | 3      | 4     | 7     | 8      | 8      | 30    |
|       | 11.90  | 9.20  | 4.90  | 2.20   | 1.80   |       |
|       | 6.656  | 2.939 | 0.900 | 15.291 | 21.356 |       |
| 3     | 4      | 5     | 8     | 5      | 8      | 30    |
|       | 11.90  | 9.20  | 4.90  | 2.20   | 1.80   |       |
|       | 5.245  | 1.917 | 1.961 | 3.564  | 21.356 |       |
| 4     | 20     | 8     | 1     | 1      | 0      | 30    |
|       | 11.90  | 9.20  | 4.90  | 2.20   | 1.80   |       |
|       | 5.513  | 0.157 | 3.104 | 0.655  | 1.800  |       |
| 5     | 4      | 14    | 10    | 1      | 1      | 30    |
|       | 11.90  | 9.20  | 4.90  | 2.20   | 1.80   |       |
|       | 5.245  | 2.504 | 5.308 | 0.655  | 0.356  |       |
| 6     | 6      | 10    | 9     | 4      | 1      | 30    |
|       | 11.90  | 9.20  | 4.90  | 2.20   | 1.80   |       |
|       | 2.925  | 0.070 | 3.431 | 1.473  | 0.356  |       |
| 7     | 19     | 9     | 2     | 0      | 0      | 30    |
|       | 11.90  | 9.20  | 4.90  | 2.20   | 1.80   |       |
|       | 4.236  | 0.004 | 1.716 | 2.200  | 1.800  |       |
| 8     | 17     | 12    | 1     | 0      | 0      | 30    |
|       | 11.90  | 9.20  | 4.90  | 2.20   | 1.80   |       |
|       | 2.186  | 0.852 | 3.104 | 2.200  | 1.800  |       |
| 9     | 25     | 5     | 0     | 0      | 0      | 30    |
|       | 11.90  | 9.20  | 4.90  | 2.20   | 1.80   |       |
|       | 14.421 | 1.917 | 4.900 | 2.200  | 1.800  |       |
| 10    | 4      | 17    | 6     | 3      | 0      | 30    |
|       | 11.90  | 9.20  | 4.90  | 2.20   | 1.80   |       |
|       | 5.245  | 6.613 | 0.247 | 0.291  | 1.800  |       |
| Total | 119    | 92    | 49    | 22     | 18     | 300   |

Chi-Sq = 180.611, DF = 36, P-Value = 0.000

This academic article was published by The International Institute for Science, Technology and Education (IISTE). The IISTE is a pioneer in the Open Access Publishing service based in the U.S. and Europe. The aim of the institute is Accelerating Global Knowledge Sharing.

More information about the publisher can be found in the IISTE's homepage:

<http://www.iiste.org>

## CALL FOR JOURNAL PAPERS

The IISTE is currently hosting more than 30 peer-reviewed academic journals and collaborating with academic institutions around the world. There's no deadline for submission. **Prospective authors of IISTE journals can find the submission instruction on the following page:** <http://www.iiste.org/journals/> The IISTE editorial team promises to the review and publish all the qualified submissions in a **fast** manner. All the journals articles are available online to the readers all over the world without financial, legal, or technical barriers other than those inseparable from gaining access to the internet itself. Printed version of the journals is also available upon request of readers and authors.

## MORE RESOURCES

Book publication information: <http://www.iiste.org/book/>

Recent conferences: <http://www.iiste.org/conference/>

## IISTE Knowledge Sharing Partners

EBSCO, Index Copernicus, Ulrich's Periodicals Directory, JournalTOCS, PKP Open Archives Harvester, Bielefeld Academic Search Engine, Elektronische Zeitschriftenbibliothek EZB, Open J-Gate, OCLC WorldCat, Universe Digital Library, NewJour, Google Scholar

